



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 1

JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203-0001

January 15, 1998

Mr. Philip Otis
Northern Division - NAVFAC
10 Industrial Highway
Code 1811/PO - Mail Stop 82
Lester, PA 19113-2090

Re: Conceptual Long-Term Monitoring Plan (LTMP) and Response to comments on the Draft LTMP, dated November 5, 1997, Site 7 Calf Pasture Point at the Former Naval Construction Battalion Center, Davisville, RI

Dear Mr. Otis:

Pursuant to §7.6 of the NCBC Federal Facility Agreement (FFA), the Environmental Protection Agency (EPA) has reviewed the above referenced document.

EPA recognizes the Navy's commitment to developing a LTMP which will adequately assess the exposures in the near shore area and forewarn the BCT of any changes in them so that the need for additional remedial alternatives may be evaluated. However thus far, the Navy has not shown a commitment to monitor the overall plume to determine the protectiveness of the proposed remedy. EPA considers the proposed remedy to consist of land-use and groundwater-use restrictions and monitoring of the plume as long as it is necessary to protect human health and the environment.

The plume consists of both a source area and of discharge areas. The source area must be monitored to determine if the levels of the contaminants have attenuated so that they are sufficiently low enough to remove the land-use and groundwater -use restrictions or if the higher concentrations in the source area are migrating toward the discharge zones. The discharge areas must be monitored to determine if the exposure to both discharging groundwater and associated sediments remains at the current no-risk level or if a more aggressive remedial action is necessary to protect human health and the environment. The combination of both source area and downgradient monitoring sites should provide an overall understanding of the plume, the need for increase or reduction in monitoring or the need for a more aggressive remedial action.

EPA disagrees with the Navy's assertion that enough data has been collected to date to determine that the plume is stable. EPA is in agreement that some reduction in monitoring may be supportable as soon as there is enough data to prove that the plume is stable, but the wholesale retreat from monitoring described by the Navy's current LTMP submittal is neither technically defensible, nor withing the constraints of CERCLA. Flexibility needs to be built into the monitoring plan to allow the BCT to agree to increase or reduce monitoring frequency and the

type and number of analytes based on overall plume increase or reduction, but such absolutes of 1 sampling event, 2 years of non-detections or 2-five year reviews of no risk at the nearshore have no basis and cannot be agreed to up front.

The LTMP does not address the inorganic constituents that are mobilized by the reductive dechlorination process (e.g., as the groundwater chemistry changes within the plumes, iron, manganese and arsenic go into and out of solution.) These inorganics are important to monitor for several reasons: 1) inorganic levels will help in the overall understanding of the plume geochemistry and 2) inorganics are CoCs in sediment and 3) inorganic levels may increase as the plume evolves in the future. In this respect, inorganics must be added to the monitoring analyte list.

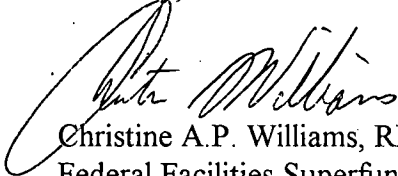
The LTMP components do not include monitoring in the sediments. Sediment monitoring must be included as the sediments are one of the medias of exposure at the discharge points.

Additionally, the Navy has repeatedly been cautioned against using an internal Region I document prepared for the Site Assessment Team which is used internally in evaluating PAs and SIs, NOT for use as a cleanup level. The internal EPA Region I 1993 ESAT Memo **MUST NOT** be referenced in any Navy document.

The Navy must resubmit the draft LTMP and adequately address EPA's concerns.

If you have any questions about this letter please call me at (617) 573-5736.

Sincerely,



Christine A.P. Williams, RPM
Federal Facilities Superfund Section

Enclosure

cc: Richard Gottlieb, RIDEM
Walter Davis, CSO
Tim Prior, USF&WS
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Jim Shultz, EA Science & Eng.

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General Comments:

1. This plan is unacceptable and should be resubmitted with EPA's concerns addressed. The following comments are lengthy and indicate our concerns with the Navy's approach to the proposed monitoring at Site 7. Many of our concerns are also applicable to the LTMP at Site 9. EPA is concerned with such a rigid prescriptive approach. The LTMP should be flexible enough to insure that representative data are collected in a time frame which allows the BCT to react quickly enough to protect human health and the environment from exposures to site contaminants. The Navy's current conceptual LTMP does not reflect the spirit of previous discussions at meetings and presents an overly-aggressive outline for the reduction of monitoring. Although it is appropriate to build flexibility into the LTMP, such flexibility must insure protectiveness under a wider range of potential future conditions. The Navy's LTMP appears to be prejudicial concerning the outcome of future monitoring, and is structured such that a time frame sufficient to establish meaningful trends is not allowed for. The LTMP also contains numerous inherent structural flaws in that key data objectives are not included. The following comments discuss the shortcomings of the LTMP in greater detail. These issues must be resolved and incorporated into the LTMP before the plan can be approved by EPA.
2. Navy has not responded adequately to EPA comments concerning the following major issues:
 - a. The source must be monitored to determine if the groundwater use restriction needs to continue to be implemented.
 - b. Inorganics must be monitored since they are COCs and in order to predict plume behavior. Further, inorganics are important indicators of plume geochemistry, and hence will provide invaluable insight into plume evolution over time.
 - c. All CVOCs found in the plume must be monitored in order to predict plume behavior.
 - d. Reduction of the number of monitoring points and frequency must be based on observable trends demonstrating a clear reduction in contaminant levels in both the source area as well as the discharge area. Typically, EPA requires a minimum of eight rounds of quarterly ground water sampling in order to determine baseline conditions from which longer term evaluation of trends can be done. The Navy should be reminded that a suitable baseline does not currently exist. Many of the site's monitoring wells have only recently been installed, and that others are needed in key areas of the plume where no data currently exists. EPA is willing to work closely with the Navy to evaluate data collected after the baseline conditions are established.
 - e. Shallow piezometers may not provide conclusive information about the near shore

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environment and should be supported with permanent monitoring well locations. The Navy should consider adding diffusion samplers to the list of temporary monitoring methods which may be used to support the locations for permanent monitoring points.

f. The objectives of the LTMP must include the monitoring of the remedy's protectiveness and effectiveness in accordance with CERCLA. To monitor the protectiveness and effectiveness the contaminant levels in all portions of the system must be evaluated: both the source area and the discharge area must be monitored. As discussed in greater detail below, this monitoring must also include upgradient and intraplume areas.

RESPONSES TO EPA GENERAL COMMENTS

3. EPA General Comment A. In response to EPA's concern regarding risks due to exposure from the source area, the Navy proposes to continue monitoring (periodic inspection) of institutional controls as long as the proposed deed restrictions are in effect. Since the institutional controls are defined as "land use restrictions which may include deed restrictions for ground water use" in the Draft Final Feasibility Study, it is not clear what the "continued monitoring" or "periodic inspection" of institutional controls will entail, or how the response addresses EPA's concern. Please clarify.

In addition, the Navy has focused on EPA's statement that the risks at the discharge area are independent of the risks at the source area and states that, consistent with EPA DQOs, monitoring activities and exit criteria at the source area and the discharge area will be pursued independently. It is not understood how this is consistent with DQOs. EPA stated that the risks were independent; however, the contamination in the discharge area is directly related to the contamination in the source area. The Navy's statement that "The remedy for the source area has been selected as institutional controls and deed restrictions" is inappropriate. A remedy for this site has not been selected, it is only being considered for proposal at this time.

The use of the alternative for institutional controls applies to the entire site and not simply the source area. It is not agreed that monitoring activities and exit criteria at the source area should be pursued independently of the discharge areas. EPA considers the proposed remedy to consist of land-use and groundwater-use restrictions and monitoring of the entire plume as long as it is necessary to protect human health and the environment.

The plume consists of a source area and downgradient discharge areas. These two zones are linked by ground water flow paths in accordance with the Navy's conceptual model for the site and basic ground water flow theory. Nonetheless, the hydrogeologic framework at Site 07 is complex and the possibility for contaminant migration along preferential pathways exists.

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In any case, a technically credible long-term monitoring approach for the site must include all of the principal components of the flow system: 1) upgradient areas; 2) source area; 3) intraplume areas; and 4) all relevant discharge zones. Further, the LTMP must include these key elements for each pertinent hydrostratigraphic unit.

The source area must be monitored to determine if the levels of the contaminants are attenuating as predicted until they are sufficiently low enough to remove the land-use and groundwater-use restrictions, are increasing, or are neither increasing nor decreasing. Discharge areas must also be monitored to determine whether exposures to both discharging groundwater and associated sediments remains the same or decreases relative to the current no-risk level, or if levels are increasing, possibly suggesting that a more aggressive remedial action is necessary to protect human health and the environment. Intraplume monitoring is also essential in order to verify that trends observed in the source area are similarly observed in the downgradient discharge areas or if, or if the higher concentrations in the source area are migrating toward the discharge zones. The combination of both source area, downgradient, and intraplume monitoring locations must provide an overall understanding of the plume as the integrated system it is. This information will serve as meaningful basis for future decisions concerning the need to increase or reduce long-term monitoring or the potential need for a more aggressive remedial action.

4. EPA General Comment B. EPA's comment stated that the proposed approach must also include monitoring of the source area to ensure that the source was depleting over time. Please refer to EPA's previous comment concerning the need to monitor the plume as a "system" which includes all key elements of the plume (i.e., upgradient, source area, intraplume areas, discharge zones). The Navy's response is essentially the same as General Comment 1 above, which requires clarification. In addition, EPA's comment should be addressed.
5. Response to General Comment B. EPA disagrees with the statement, "Commingling of different independent objectives in a monitoring plan diminishes its focus and is inconsistent with EPA's DQO principles." DQO's are a planning process which embodies the QA philosophy of planning, implementation, and assessment. Through the ongoing assessment of DQOs, a sense of the project's status can be obtained and future plans and decisions can be formed. DQOs help establish and present the objectives of a project, they do not control it. Old DQOs may lead to new DQOs as a project proceeds to completion and new information is used to refine DQOs. In fact the DQOs of today may change by the time the LTM starts. A more correct statement might be: "The EPA DQO process will be used to develop the scope, objectives, and contingencies of the LTMP, as defined by the Proposed Plan."
6. EPA General Comments C-2 and C-3. The Navy response is unacceptable. The purpose

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of the CLTMP is to identify possible changes in risk posed by the site to local receptors. The Navy's response is incorrect in that it implies that previous investigations, all of which have been done without the benefit of confirmation of all of the key ground water discharge zones, appropriately account for present risk from ground water, not to mention potential future risk. This can only be accomplished through monitoring the potential discharge points of contamination at the site and identifying contaminant trends, after these discharge locations have been confirmed. It is therefore imperative that the appropriate zones are monitored. As stated in the EPA comment, the seeps identified during the performance of the monitoring program may be the result of seepage of seawater intrusion or recent rainfall. The Navy states that the seeps are the only conduits along the discharge area which may pose an unacceptable risk. This statement has not been substantiated. For instance, the conceptual model for the site suggests that deep contamination is discharging to the harbor and adjacent wetlands, at least in part in response to density differences between the "fresh" ground water and saline seawater. For this reason, among others, groundwater may be discharging to the surface water from various points other than seeps identified above mean sea level.

In any event, it is extremely important to identify the appropriate shallow groundwater monitoring points. It has been previously agreed that ground water discharge zone(s) have not yet been adequately identified. It was further agreed previously, that as a part of implementing the LTMP, the ground water discharge locations would be identified as a first step in developing a monitoring strategy for this key portion of the LTMP. The Navy's suggestion of a series of "pre-sampling" inspections" as a means of identifying appropriate monitoring points is a good one, but such inspections should include a number of different activities including but not necessarily limited to periodic visual inspections, installation of arrays of temporary piezometers or well points, installation of arrays of diffusion sampler or other passive sampling techniques, etc. These activities will serve as the basis for determining the appropriate locations for permanent monitoring point installations.

7. EPA General Comment C-4. The CLTMP has proposed only one shallow monitoring well. Since this is the zone which discharges to the local receptors, better coverage (permanent monitoring points) is required to adequately monitor the stability of the plume and the potential risks posed by the site. Please refer to previous comments, (e.g., comment 3, above) for additional discussion of minimum plume monitoring requirements.
8. EPA General Comment C-6. See EPA General Comment A and B above. Since the contamination in the discharge area is directly related to the contamination in the source area, exit criteria will be required for the source area.
9. Since the remedy is based on the drinking water exposure scenario, exit criteria must

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include achieving MCLs in the source area. Reduction in the frequency of monitoring must be evaluated based on the demonstrated downward trend of the site contaminants at both the source area and at the discharge zone.

10. EPA General Comment D. The Navy's response is not appropriate. If one of the objectives of the CLTMP is to determine plume stability, it is imperative that the appropriate horizons or discharge points are monitored. This criterion necessitates the need to understand groundwater flow conditions to verify appropriate monitoring is occurring. This requirement is not confusing the process but is a required element necessary to achieve the desired objectives of the CLTMP. It is not clear how such a requirement is inconsistent with EPA's DQO objectives. The Navy has clearly misinterpreted our comment. EPA is not suggesting only one sampling round, EPA is providing the Navy with additional well locations for all sampling rounds which as sampled over three times each year should provide more information than what would be gathered if the LTM was based only on the Navy's proposed locations. It should be stated that the original suggestion offered in the EPA comment on this point presents an outline of one means of addressing the types of data gaps which currently exist. The Navy's response that, "it is highly unlikely that a single reading from a triangular group of wells on a given day 'defines variations in ground water flow patterns with climatic conditions.'" is true in the respect that a greater level of effort is likely needed to fully address this issue. The "triangular groups of wells" referred to in the Navy's response therefore indicate a minimum LOT. A greater number of monitoring points, nested or clustered so as to allow for monitoring as all key aquifer horizons, will likely be needed once ground water discharge locations are identified.
11. EPA General Comment D, part 4. It is agreed that permanent wells within the tidal zone downgradient of MW21 and perhaps of MW25 may be expensive to maintain. The use of the barge mounted drill rig to place borings in the intertidal zone in front of the landfill was also expensive, but provided us with valuable screening level data that would be appropriate for monitoring on an annual basis at this site.
12. EPA General Comment D, part 2. One of the objectives of the CLTMP must be to determine flow conditions so that the monitoring points can be demonstrated to be downgradient of the plume and along the flow lines. Groundwater plume boundaries may move depending on the hydrological and geochemical changes within the aquifer.

CLTMP GENERAL COMMENTS

13. The Navy responses seem to differ significantly than what was agreed to, and/or presented at the meeting on July 22, 1997. The Navy responses to EPA comments highlight the gap between objectives of the CLTMP and the means for achieving these objectives. There are many divergent views that need to be addressed before the CLTMP can be finalized.

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In order to expedite the process, EPA, RIDEM and the Navy should meet to discuss the issues and reach a point of agreement. Major differences related to objectives of the CLTMP, contaminants to monitor (e.g., inclusion of inorganic and organic daughter products), identification of ground water discharge locations, monitoring point locations (e.g., temporary versus permanent, or combination of both), frequency and types of sampling for all affected media, and exit criteria are all issues that need to be resolved.

14. It should be noted that, in accordance with CERCLA Section 121(c), 5 year reviews will be required as long as any hazardous substances, pollutants or contaminants remain at the site to assure that human health and the environment are being protected. As the Navy is not proposing to remove the source area, this requirement will continue as long as the source area contains contaminant levels that are above MCLs. Groundwater monitoring will be required, at least annually, to provide a basis for 5 year reviews.
15. In the Navy's Responses to EPA Comments on the Draft Proposed Plan for Calf Pasture Point Site 07 (July 1997, Comment 3), the Navy "agreed to include seep samples from the shoreline and sediment/surface water samples from the interior wetlands as part of the monitoring program until such time when the BCT is confident that these media will continue to pose no unacceptable risk to human health and the environment." As agreed, the Navy should include the sampling of this media in the CLTMP.
16. The version of the CLTMP dated July 17, 1997 considered threshold levels for inland monitoring wells. Based on EPA's comment regarding natural attenuation, the inland threshold levels were removed from the current CLTMP which now only contains threshold levels for the shallow shoreline piezometers. As a result, it is not clear how the data obtained from the inland monitoring wells, or the shoreline deep or bedrock monitoring wells, will be evaluated. In accordance with EPA DQO procedures, this information is necessary. Please clarify.

EPA SPECIFIC COMMENTS

17. Specific Comment 1. EPA disagrees with the Navy's plan to monitor only certain VOCs in groundwater and none in sediments. All chlorinated VOCs found so far at the site and their daughter products must be monitored in the plume. In addition, all inorganics associated with the changes in geochemistry due to the degradation of the chlorinated VOCs, such as arsenic, manganese and iron, must also be monitored in the plume. These constituents are necessary for the overall understanding of the plume and to determine if the threat to human health and the environment is changing over the life of the plume. Specific Comment 2. With respect to the Navy's statement, "Given the site conditions and the age of the plume, the stability of the onsite ground water plume has been demonstrated by several investigations and observations, spanning over more than a decade." EPA strongly disagrees with this statement for the following reason:

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Between 1988 and 1994, 8 shallow wells (MW07-01S through -08S) and 7 deep wells (MW07-03D, -05D, -09D, -10D, -11D, -12D, and -13D) were installed and sampled. During this period, each of these wells was sampled once with the exception of monitoring wells MW07-01S, -02S, -03S and -04S which were sampled twice. In 1995, 32 additional wells were installed and sampled. Also, the existing wells MW07-01S, -02S, -03S, -03D, -04S, -05S, -05D, -06S, -07S, -08S, -09D, -10D, -11D, -12D and -13D were re-sampled.

In summary, the ground water data collected to date includes four shallow wells which have been sampled two times and four shallow wells that have been sampled three times; seven deep wells which have been sampled twice; and all of the wells installed in 1995 were sampled once. It should also be noted that, prior to 1995, only five monitoring wells (MW07-09D, -10D, -11D, -12D, -13D) were located downgradient and a distance from the source area (i.e., all other monitoring wells were located upgradient or in the close vicinity of the source area).

It is not understood how the determination of the stability of the plume can be made based on the limited ground water sampling conducted to date, particularly since there has been no repeat sampling from the majority of the wells, many of which are more strategically located to provide information on the stability of the plume. The Navy should provide specific information which will support this statement or remove it from the CLTMP.

In addition, the part of the Navy's response which refers to "... several investigations and observations, spanning over more than a decade," exaggerates the significance of the extremely limited ground water data which was collected from 1988 to 1994. This text must be modified.

18. EPA Specific Comment 3. The Navy primarily proposes the use of shallow temporary piezometers for evaluating plume stability and potential contaminant discharge to local receptors (only one shallow permanent well MW07-21 is proposed for sampling on a recurrent basis). Because of limitations identified with the use of the shallow piezometers in previous EPA comments, EPA recommends a combination of permanent wells and temporary piezometers. The primary concern with the use of shallow temporary piezometers is the concern that they may not be monitoring the proper horizon, and the fact that trends (non-statistical, i.e., increasing or decreasing) cannot be established with non-fixed points. The Navy should reevaluate its position concerning the nearly complete reliance on shallow temporary piezometers for the monitoring of the shallow groundwater.
19. EPA Specific Comment 4. The determination as to whether the interior wetland has been impacted should be assessed by both groundwater, surface water and sediment sampling. Whether the surface water or sediment sampling is incorporated into the CLTMP or is performed separately outside of the scope of the CLTMP is irrelevant, as long as it has

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taken place so that historical impacts to the interior wetland can be assessed and a baseline established. Once the surface water and sediment baseline conditions have been evaluated and assessed for the interior wetlands, groundwater can then be utilized for monitoring the wetlands, since groundwater contamination is likely the primary source of potential contamination to the interior wetland. However, with respect to inorganics, routine sediment sampling should be required in the CLTMP because of the concern for accumulation/concentration of inorganic constituents.

20. EPA Specific Comment 5. EPA requested that screening be performed to maximize the selected locations of the piezometers. The Navy's response is confusing and not acceptable. The Navy states that the use of GC or PID reading measurements is only reflective of that moment sampled and therefore the Navy does not intend to use such methods. The purpose of the field screening is to identify discreet horizons that are contaminated. This method provides real-time data and is better suited than the means stated by the Navy which is solely based on visual observation. Confirmation of the presence of contamination with field screening far outweighs the visual methods to be employed by the Navy. Please refer to above comment.
21. EPA Specific Comment 6. The Navy's response is not adequate. In order to monitor discharge points, shallow groundwater needs to be monitored. MW07-23S and MW07-13S should be included because of their key locations to receptors. The monitoring of these locations will provide an early indication of potential concerns which may need to be addressed by other means. The Navy states that these sample points are not warranted at this time. This suggests that at some time in the future, conditions may warrant their inclusion. EPA believes that these points must be sampled.

Additionally, the Navy disagrees with the need for a cluster of wells along the western shore. This issue is at the heart of the majority of differences between the Navy and EPA. This issue should be resolved in a meeting to come to a mutual agreement prior to the Navy readdressing these comments.

22. EPA Specific Comment 7. At issue is the need for a well cluster along the western shoreline. The Navy contends that this is not needed. The need for more permanent monitoring points and an understanding of plume characteristics for appropriate monitoring is key to the successful monitoring program. Groundwater contaminant delineation along the western shoreline is not clearly defined which necessitates the inclusion of well clusters in this area.
23. EPA Specific Comment 8. The Navy's response is inadequate. The objectives of the CLTMP are to assess plume stability and to monitor risks posed by the site. This is achieved by monitoring increasing or decreasing trends in contaminant levels which may

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necessitate the need for another risk assessment. Chlorinated compounds are the primary COCs. One of the COCs is 1,1,2,2-PCA. This compound can biodegrade into several other contaminants, some of which may be more toxic than the parent material. Because the potential for biodegradation at the site has not been fully assessed, the potential for biodegradation is certainly a possibility, the extent to which is unknown at this time. Therefore, monitoring of daughter products of 1,1,2,2-PCA in addition to Tetrachloroethene and its daughter products is required so that potential increases in risk as a result of potential degradation, can be monitored/assessed. Monitoring of all chlorinated compounds found at the site and their associated daughter products is also required to be able to evaluate the potential decreases in risk. Change in levels of dissolved inorganic constituents often accompanies biodegradation of organic compounds. As such, appropriate inorganics should be included in the monitoring program as long as such biodegradation is occurring.

24. EPA Specific Comment 10. The Navy states that the CLTMP objective is to confirm plume stability, not to verify or establish trends. Yet in the CLTMP under "Post Baseline Monitoring, LTMP Scale Down" the plan states that annual sampling will be discontinued when no exceedences in two consecutive years are documented, and "the COC concentrations in each well does not show a significant increasing trend". This CLTMP indicates that a purpose is to monitor trends from results of the CLTMP, which contradicts the response to this EPA comment. An objective of the CLTMP is to verify, establish, and/or monitor trends. The Navy must revise the CLTMP to reflect this. Inorganics need to be included in the LTMP (see previous comment).
25. EPA Specific Comment 12; Please identify the specific "speculative statements," referred to in the Navy's response. The original comment has not been addressed.
26. EPA Specific Comment 16. The Navy response is unacceptable and highlights the major distance in agreement between the Navy and EPA. This may be due in part to confusion in interpreting/understanding the Navy's flow diagram. In any aspect it is not appropriate to stop annual sampling after two consecutive non exceedances or trends. Trends are not based on two points (or sampling rounds). Trends are based on at least 8 rounds of acceptable data collection. If the Navy is concerned about "aimless, endless monitoring activities," then perhaps more aggressive remedial measures should be considered. As discussed in numerous previous comments above, EPA considers monitoring in all key areas of the ground water system to be essential, but additional work is needed in order to clarify "risks due to exposures at discharge areas." It is universally agreed that these ground water discharge areas have not yet been identified, and the Navy's response is therefore premature. Inorganic monitoring will be required for reasons specified in previous comments. For additional discussion, please refer to previous comments.

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CLTMP SPECIFIC COMMENTS

27. Section 3, LTMP Principles, Page 2, Paragraph 1. It is stated that "DQO requires that any investigation be planned through a series of steps . . . , " and four steps are listed. However, these are not the steps of the DQO process.

As stated in the *Guidance for the Data Quality Objectives Process*, Final, EPA QA/G-4, EPA/600/R-96/055, September 1994, the DQO Process consists of seven steps which are: (1) State the Problem, (2) Identify the Decision, (3) Identify the Inputs to the Decision, (4) Define the Study Boundaries, (5) Develop a Decision Rule, (6) Specify Tolerable Limits on Decision Errors, and (7) Optimize the Design. This section should be modified accordingly and the data collection activities of the CLTMP should be reevaluated with respect to these steps.

28. Section 3, LTMP Objective, Page 3, Paragraph 1. The objective is stated as "The main objective of the LTMP is to provide a flexible plan to confirm that the plume is stable at concentrations sufficiently protective of the expected recreational and ecological receptors at the discharge area." However, the Navy Does not specify how the determination of plume stability will be made. In accordance with DQO Guidance, this would require, among others, the development of a decision rule and the specification of tolerable limits. The Navy should clearly present the method by which plume stability will be determined based on DQO Guidance.
29. Section 3, LTMP Objective, Page 3, Paragraph 1. The Navy has missed some objectives of this plan. The objectives must also include 1. the monitoring of the protectiveness of the proposed remedy by the groundwater monitoring of both the source areas and the discharge areas and by doing an annual site walkover to determine if drinking water wells have been installed on the property that might intercept the plume, 2. The monitoring of the effectiveness of the remedy by evaluation of the data with the MCLs or the AWQC, and 3. The inspection of deeds and titles to determine if appropriate institutional controls exist on record.
30. Section 3, LTMP Objective, Page 3, Bullet 1. It is stated: "Given the site conditions and the age of the plume, the stability of the onsite groundwater plume has been demonstrated by several investigations and observations, spanning more than a decade. Data collected during these investigations have shown no significant increasing or decreasing trends." EPA does not agree with this statement at this time and additionally, it is in conflict with the stated objective of the LTMP which is to confirm the stability of the plume. If the plume were known to be stable, the stability would not need to be confirmed. In addition, the sentence addressing the data collected to date and the lack of any trends is misleading since this conclusion cannot be drawn from the present data (see EPA Specific Comment 2). These sentences should be removed from the CLTMP.

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31. Section 3, LTMP Objective, Page 3, Bullet 2. The Navy states that a VOC plume in a coastal area usually reaches a stable condition within five years of the initial release, according to national experts. The stability of the plume at Calf Pasture Point must be demonstrated by the LTMP regardless of expert opinion which may or may not have been made with the specific information about the source area and the Site. This sentence has no bearing on the LTMP and should be removed.
32. Section 3, LTMP Objective, Page 3, Bullet 3. It is stated in the first sentence that "LTMP is not a characterization effort, instead it is aimed at confirming the observed stability of the chlorinated VOC groundwater plume." The word "observed" should be removed from this sentence. In addition, the second sentence refers to RI-type sampling and measurements for model validation. This sentence is not relevant to the CLTMP and should be removed.
33. Section 3, Appropriate Data Coverage, Page 4. This paragraph should be re-written to state: "Data needs will be met by including plume centerline and cross gradient locations starting from the source area and including the discharge zone. Such an approach will provide data to evaluate the protectiveness and effectiveness of the proposed remedy."
34. Section 3, Appropriate Condition, Page 4. The LTMP must also focus on the source area. The LTMP must also provide data for evaluation of trends of contaminant levels under various climatic conditions.
35. Section 3, Appropriate Data, Page 4. Samples must be analyzed for the primary CoCs, the contaminants the Navy dumped, their daughter products and for inorganics.
36. Section 3, LTMP Objective, Page 4, Bullet 4. Inorganic analytes must be included in the LTMP since they are site COCS and the inorganics help in the overall understanding of the plume geochemistry.
37. Section 4.1, Shoreline Shallow Piezometer Samples, Page 4, Paragraph 1. The Navy states that shallow shoreline piezometers (depth of 2 to 5 feet) will be used to assess plume stability along potential discharge areas. First, the Navy needs to provide further clarification on the "potential discharge areas" since one interpretation is the entire intertidal area in the entrance channel. Several general areas of ground discharge exist along the western shore of Calf Pasture Point and at the freshwater wetlands inland of the dune line. Please clarify. Second, while the data obtained from the piezometers may potentially be used in a comparison against threshold values, it would not be appropriate to use this data to assess plume stability as a result of the significant flushing and dilution which occurs in the shoreline area. The reference to using the shallow shoreline piezometers to assess plume stability should be removed.

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38. Section 4.1, Shallow Well/Interstitial Groundwater Samples, Page 5, Paragraph 1. The number of shallow monitoring wells in the CLTMP needs to be increased in order to assess plume stability in the shallow aquifer and to ensure the protectiveness of the remedy. Currently, the Navy has proposed one well, MW07-21S, which is not sufficient. Add locations 13, 19, 23 & 26. In addition, it is not clear from Figure 1 that the proposed shallow piezometer location (east/northeast of MW07-21S) in the wetland area is the most appropriate location. Please provide the rationale for this location.
39. Section 4.1, Deep Well Samples, Page 5, Paragraph 1. Add well locations 19, 27, 17 & 5 to the list to monitor the centerline of the plume from source area to discharge areas. The targeted wells to assess the plume stability in the deep aquifer include MW07-22D. Since this well is located upgradient of the residual DNAPL area (MW07-05D), it is not clear why it is included. Please clarify.
40. Section 4.1, Groundwater Head Measurement, Page 5. The Navy must provide updated groundwater flow measurements at each well each time the groundwater is sampled.
41. Section 4.1, Analytes, Page 6, Paragraph 1. It is stated that collected samples will be analyzed for 1,1,2,2-PCA, TCE and TCE daughter products. Any daughter products of 1,1,2,2-PCA should also be included. Inorganic constituents which may accompany biodegradation of organics should also be included.
42. Section 4.4a, Source Area Threshold Criteria. Add this section. Exit criteria must be MCLs in order to remove the groundwater use restrictions on the property.
43. Section 4.3, Shoreline Threshold Criteria, Page 7. Threshold criteria must be NOAA ERM, AWQC or agreed to PRGs. The Navy must not use or reference the internal EPA 1993 ESAT memo.
44. Section 4.2, Analysis of Climatic Data, Page 7. EPA, RIDEM and Navy should meet to discuss what is "normal precipitation" should be defined as. This anomalous definition should be referenced.
45. Section 4.2, LTM Wells and Piezometers, Page 7. Wells will be evaluated to be eliminated from the sampling program after several rounds of data not just 1 year. Re-write the last sentence to read, "Wells that are neither down-gradient of the disposal source location, nor up-gradient of discharge points will be evaluated for elimination from the sampling program after 8 rounds of acceptable data."
46. Section 4.1, Sampling Frequency, Page 6. Re-write the first sentence to read, "Samples will be collected three times during the year and a frequency reduction will be evaluated by

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the BCT at the end of each year.” Threshold Values Table, Page 8. The footnote for the human health threshold values specifies “based on dermal contact with surface water during wading exposure scenario.” It is not clear if this value was previously calculated for the Site, if this was obtained from a reference source, or if it was calculated for the CLTMP. Please clarify and also include the clarification in the footnote. See previous comment on the un-acceptability of the Navy’s use of the ESAT memo.

47. Section 4.4, Post Baseline Monitoring, Ten-Year Review, Page 9. EPA cannot agree to eliminate monitoring until the source area no longer poses a threat to human health and the environment. When the source area is below MCLs the need for groundwater use restrictions can be eliminated and there will be no longer any need for the preferred remedy. Remove this section from the LTMP.
48. Section 4.4, Post Baseline Monitoring, Activation of Remedial Contingencies, Page 8. EPA is concerned that the Navy may wait for over 3 years before contingency plans are implemented. This section states that “if two consecutive annual exceedances occur and if deemed appropriate, the following tasks will be considered: etc.”. Is the baseline monitoring program considered one of the years described in the previous statement? Also, what if there are two exceedances observed during the baseline monitoring years (which contains 3 groundwater sampling rounds)? EPA is concerned that under this present statement, it may take 3 years (baseline year plus 2 annual monitoring rounds) for contingency plans to begin to be implemented. Change the sentence to add, “.... two consecutive exceedances occur, and if during data evaluation the BCT deems it appropriate, the following tasks may be implemented: (a) sampling from existing upgradient shallow, deep and bedrock wells at the site in order to determine”. The first sentence should be re-written to state, “Frequency of sampling and analysis of LTM wells will be evaluated after 8 rounds of acceptable data.”
49. Figure 2. This figure contains a diamond box which states “Site-related Sediment COC” and if the response is yes, “Incorporate Sediment COC Sampling.” These items are not discussed in the CLTMP and should be included in the text for clarification.